

**Amendment and Response**

Applicant: Curtis Gregory Kelsay

Serial No.: 09/491,994

Filed: Jan. 26, 2000

Docket No.: 10990356-2

Title: AN OPTICAL INTERLINK BETWEEN AN OPTICAL TRANSDUCER AND OPTICAL DATA PORT

a first lens provided between the first end of the transmit light pipe and the optical transducer, wherein the first lens is adapted to optically couple the optical transducer to the transmit light pipe and collimate light received from the optical transducer into the first end of the transmit light pipe; and

a second lens provided at the second end of the transmit light pipe, wherein the second lens is adapted to increase an angle of light exiting the optical data port.

23. The light pipe assembly of claim 22, wherein the first lens and the second lens of the transmit light pipe are formed as part of the transmit light pipe.

24. The light pipe assembly of claim 22, wherein the angle of light exiting the optical data port is adapted to diverge from the optical data port.

25. The light pipe assembly of claim 20, wherein a first end of the receive light pipe is adapted to be optically coupled to the optical transducer and a second end of the receive light pipe is adapted to provide a portion of the optical data port.

26. The light pipe assembly of claim 25, further comprising:

a first lens provided between the first end of the receive light pipe and the optical transducer, wherein the first lens is adapted to optically couple the receive light pipe to the optical transducer; and

a second lens provided at the second end of the receive light pipe, wherein the second lens is adapted to collimate light received at the optical data port into the second end of the receive light pipe.

27. The light pipe assembly of claim 26, wherein the first lens and the second lens of the receive light pipe are formed as part of the receive light pipe.

28. A method of optically coupling an optical transducer adapted to transmit and receive information optically with an optical data port, the method comprising the steps of:

receiving light rays at the optical data port;

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collimating the received light rays into a first end of a receive light pipe;  
optically transmitting the received light rays within the receive light pipe from the first end of the receive light pipe to a second end of the receive light pipe;  
optically transmitting the received light rays to the optical transducer from the second end of the receive light pipe; and  
receiving the received light rays at the optical transducer.

29. The method of claim 28, wherein the step of collimating the received light rays includes passing the received light rays through a lens at the first end of the receive light pipe.

30. The method of claim 28, further comprising the steps of:  
transmitting light rays from the optical transducer;  
collimating the transmitted light rays into a first end of a transmit light pipe;  
optically transmitting the transmitted light rays within the transmit light pipe from the first end of the transmit light pipe to a second end of the transmit light pipe; and  
distributing the transmitted light rays from the second end of the transmit light pipe.

31. The method of claim 30, wherein the step of distributing the transmitted light rays includes exiting the transmitted light rays from the optical data port.

32. The method of claim 31, wherein exiting the transmitted light rays from the optical data port includes increasing an illumination angle of the transmitted light rays exiting from the optical data port.

33. The method of claim 32, wherein increasing the illumination angle of the transmitted light rays includes passing the transmitted light rays through a lens at the second end of the transmit light pipe and diverging the transmitted light rays exiting from the optical data port.

34. (Twice Amended) An optical interlink, comprising:  
an optical transducer adapted to transmit and receive information optically;

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a light pipe having a first end optically coupled to the optical transducer and a second end arranged to provide an optical data port;

a transmit lens adapted to increase an angle of illumination of light exiting the optical data port; and

a receive lens adapted to collimate light into the light pipe.

35. The optical interlink of claim 34, wherein the light pipe provides bi-directional communication between the optical transducer and the optical data port.

36. The optical interlink of claim 34, wherein the optical transducer includes an infra-red transducer.

37. The optical interlink of claim 34, wherein the optical transducer includes a receive portion and a transmit portion, and wherein the light pipe includes a receive light pipe optically coupled to the receive portion of the optical transducer and a transmit light pipe optically coupled to the transmit portion of the optical transducer.

38. (Amended) The optical interlink of claim 37, wherein the transmit lens is adapted to increase the angle of illumination of light from the transmit light pipe and the receive lens is adapted to collimate light into the receive light pipe.

39. The optical interlink of claim 34, wherein the optical interlink is configured to optically exchange information for a printer, wherein the optical transducer and the light pipe are disposed within the printer and wherein the light pipe is adapted to optically exchange information with the optical transducer and externally of the printer.

40. (New) The light pipe assembly of claim 20, wherein the transmit light pipe is adapted to diverge light from the optical data port, and wherein the receive light pipe is adapted to converge light on the optical transducer.

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41. (New) A method of optically coupling an optical transducer adapted to transmit and receive information optically with an optical data port, the method comprising the steps of:
- receiving light rays at the optical data port;
  - collimating the received light rays into a receive light pipe;
  - optically transmitting the received light rays within the receive light pipe;
  - optically transmitting the received light rays to the optical transducer from the receive light pipe, including converging the received light rays on the optical transducer;
  - transmitting light rays from the optical transducer;
  - collimating the transmitted light rays into a transmit light pipe;
  - optically transmitting the transmitted light rays within the transmit light pipe; and
  - distributing the transmitted light rays from the transmit light pipe, including exiting and diverging the transmitted light rays from the optical data port.
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